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MODEL ROB-24

24-Channel External Relay Board

USER MANUAL

FILE: MROB24.C3f

Notice

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Chapter 1: Introduction

ROB-24 is a twenty-four channel electromechanical relay output accessory card. On-board amplifiers allow the relays to be driven by any 24-bit group of any ACCES digital I/O card or from other manufacturer's LSTTL or NMOS/CMOS-compatible digital output cards that use 37 or 50-pin connections compatible with the pin connections listed later in this manual. When an input bit is high, the associated relay is energized and a red LED associated with each relay glows when that relay is actuated.

SPDT Form C relays are standard but DPDT Form C relays are an available option. The relays used are UL-recognized, non-latching, polarized units designed to FCC Part 68 isolation requirements and can switch up to three amperes current into a resistive load at voltages up to 120 VAC (rms).

The card is normally powered by +5 VDC external power but an option is available for 115 VAC, 60 Hz external power. In both cases, screw terminals are provided for termination of input power connections.

As mentioned earlier, the card may be interfaced to any 24-bit port of an ACCES DIO-Series card. Relay numbers and corresponding port-bit assignments are as follows:

Relay	Port Bit	Relay	Port Bit
1	PA0	13	PB4
2	PA1	14	PB5
3	PA2	15	PB6
4	PA3	16	PB7
5	PA4	17	PC0
6	PA5	18	PC1
7	PA6	19	PC2
8	PA7	20	PC3
9	PB0	21	PC4
10	PB1	22	PC5
11	PB2	23	PC6
12	PB3	24	PC7

Controlling ROB-24

Programming ROB-24 is done by simple OUT statements. For example, if the card is to be controlled by an ACCES model IOD-24E located at base address hex 310, C statements would be as follows:

```
OUTPORTb(0x313,0x80);        //Sets the ports to use as outputs
OUTPORTb(0x310,1);           //Activates Port A, bit 0 (Relay K1)
OUTPORTb(0x311,16);          //Activates Port B, bit 4 (Relay K13)
OUTPORTb(0x311,0x80);        //Activates Port B, bit 7 (Relay K16)
```

Alternatively, any parallel, TTL-compatible, source can be used to drive the relays and would be programmed according to instructions provided by the manufacturer. Please assure that the pin-out and cable configuration is compatible with the ROB-24 pin assignments listed on the following pages.

Specifications

Logic Inputs (24 Lines)

- Logic High: 2.0 to 5.0 VDC.
- Logic Low: 0 to 0.8 VDC.
- Input Load (Hi): 70 microamperes.
- Input Load (Lo): 600 microamperes.

Relay Outputs (ROB-24)

- Contacts: Form C, SPDT, non-latching (DPDT is an option).
- Contact Material: Gold overlay silver.
- Contact Rating:
  - Max. Switching Current: 2A DC, 1.5 AC.
  - Max. Carry Current: 2A AC or DC.
  - Max. Switching Power: 30 W DC - 60 V AC.
  - Max. Switching Voltage: 150 VDC or 220 V AC.
- Actuate Time @ nominal voltage: 8 milliseconds max. including bounce
- Release Time @ nominal voltage: 8 milliseconds max. including bounce
- Vibration: 10 to 55 Hz, 10 g
- Shock: No Contact Opening: 10 g (11 mSec sine half wave)
- Life Expectancy: Mechanical: 20 x 106 operations minimum.

Note

Good safety practice should be followed if AC voltages are to be switched by the relays

Power Required

DC Power

- ROB-24: +5 VDC (±5%) at 2.5amps maximum (all relays ON)

AC Power Option

- ROB-24: 115 VAC, 60 Hz at 310 mA max. (all relays ON)

Environmental

- Operating Temperature Range: 0 °C. to 50 °C.
- Storage Temperature Range: -30 °C. to 105 °C.
- Humidity: 45 to 85% RH, non-condensing

- Dimensions: 16" long x 4.75" wide x 2" high. (406 mm x 121 mm x 51 mm)
- Weight: 2.25 lbs. max (model ROB-24-1-2)
- Screw Terminal Wire Spacing: 0.2 " (5 mm)
- Screw Terminal Wire Sizes: 12-22 AWG

Chapter 2: Installation

The software provided with this card is contained on either one CD or multiple diskettes and must be installed onto your hard disk prior to use. To do this, perform the following steps as appropriate for your software format and operating system. Substitute the appropriate drive letter for your CD-ROM or disk drive where you see d: or a: respectively in the examples below.

CD Installation

DOS/WIN3.x

1. Place the CD into your CD-ROM drive.
2. Type D : Enter to change the active drive to the CD-ROM drive.
3. Type I N S T A L L Enter to run the install program.
4. Follow the on-screen prompts to install the software for this card.

WIN95/98/NT

A. Place the CD into your CD-ROM drive.
B. The CD should automatically run the install program after 30 seconds. If the install program does not run, click START | RUN and type d:install, click OK or press Enter.
C. Follow the on-screen prompts to install the software for this card.

3.5-Inch Diskette Installation

As with any software package, you should make backup copies for everyday use and store your original master diskettes in a safe location. The easiest way to make a backup copy is to use the DOS DISKCOPY utility.

In a single-drive system, the command is:

D I S K C O P Y A : A : Enter

You will need to swap disks as requested by the system.
In a two-disk system, the command is:

D I S K C O P Y A : B : Enter

This will copy the contents of the master disk in drive A to the backup disk in drive B.

To copy the files on the master diskette to your hard disk, perform the following steps.

a. Place the master diskette into a floppy drive.

b. Change the active drive to the drive that has the diskette installed. For example, if the diskette is in drive A, type A : Enter.

c. Type I N S T A L L Enter and follow the on-screen prompts.

Directories Created on the Hard Disk

The installation process will create several directories on your hard disk. If you accept the installation defaults, the following structure will exist.

[CARDNAME]

Root or base directory containing the SETUP.EXE setup program used to help you configure jumpers and calibrate the card.

DOS\PSAMPLES: A subdirectory of [CARDNAME] that contains Pascal samples.
DOS\CSAMPLES: A subdirectory of [CARDNAME] that contains "C" samples.
Win32\language: Subdirectories containing samples for Win95/98 and NT.

WinRisc.exe

A Windows dumb-terminal type communication program designed for RS422/485 operation. Used primarily with Remote Data Acquisition Pods and our RS422/485 serial communication product line. Can be used to say hello to an installed modem.

ACCES32

This directory contains the Windows 95/98/NT driver used to provide access to the hardware registers when writing 32-bit Windows software. Several samples are provided in a variety of languages to demonstrate how to use this driver. The DLL provides four functions (InPortB, OutPortB, InPort, and OutPort) to access the hardware.

This directory also contains the device driver for Windows NT, ACCESNT.SYS. This device driver provides register-level hardware access in Windows NT. Two methods of using the driver are available, through ACCES32.DLL (recommended) and through the DeviceIOControl handles provided by ACCESNT.SYS (slightly faster).

SAMPLES

Samples for using ACCES32.DLL are provided in this directory. Using this DLL not only makes the hardware programming easier (MUCH easier), but also one source file can be used for both Windows 95/98 and WindowsNT. One executable can run under both operating systems and still have full access to the hardware registers. The DLL is used exactly like any other DLL, so it is compatible with any language capable of using 32-bit DLLs. Consult the manuals provided with your language's compiler for information on using DLLs in your specific environment.

VBACCES

This directory contains sixteen-bit DLL drivers for use with VisualBASIC 3.0 and Windows 3.1 only. These drivers provide four functions, similar to the ACCES32.DLL. However, this DLL is only compatible with 16-bit executables. Migration from 16-bit to 32-bit is simplified because of the similarity between VBACCES and ACCES32.

PCI

This directory contains PCI-bus specific programs and information. If you are not using a PCI card, this directory will not be installed.

SOURCE

A utility program is provided with source code you can use to determine allocated resources at run-time from your own programs in DOS.

PCIFind.exe

A utility for DOS and Windows to determine what base addresses and IRQs are allocated to installed PCI cards. This program runs two versions, depending on the operating system. Windows 95/98/NT displays a GUI interface, and modifies the registry. When run from DOS or Windows3.x, a text interface is used. For information about the format of the registry key, consult the card-specific samples provided with the hardware. In Windows NT, NTioPCI.SYS runs each time the computer is booted, thereby refreshing the registry as PCI hardware is added or removed. In Windows 95/98/NT PCIFind.EXE places itself in the boot-sequence of the OS to refresh the registry on each power-up.

This program also provides some COM configuration when used with PCI COM ports. Specifically, it will configure compatible COM cards for IRQ sharing and multiple port issues.

WIN32IRQ

This directory provides a generic interface for IRQ handling in Windows 95/98/NT. Source code is provided for the driver, greatly simplifying the creation of custom drivers for specific needs. Samples are provided to demonstrate the use of the generic driver. Note that the use of IRQs in near-real-time data acquisition programs requires multi-threaded application programming techniques and must be considered an intermediate to advanced programming topic. Delphi, C++ Builder, and Visual C++ samples are provided.

Findbase.exe

DOS utility to determine an available base address for ISA bus , non-Plug-n-Play cards. Run this program once, before the hardware is installed in the computer, to determine an available address to give the card. Once the address has been determined, run the setup program provided with the hardware to see instructions on setting the address switch and various option selections.

Poly.exe

A generic utility to convert a table of data into an nth order polynomial. Useful for calculating linearization polynomial coefficients for thermocouples and other non-linear sensors.

Risc.bat

A batch file demonstrating the command line parameters of RISCTerm.exe.

RISCTerm.exe

A dumb-terminal type communication program designed for RS422/485 operation. Used primarily with Remote Data Acquisition Pods and our RS422/485 serial communication product line. Can be used to say hello to an installed modem. RISCTerm stands for Really Incredibly Simple Communications TERMinal.

Installing the Card

The ROB-24 is installed external to the host computer. The card is supplied with eight (8) half-inch (0.5") stand-offs with 4/40 threads and may be installed on user-supplied panels/chassis. The card provides headers for both 37- and 50-conductor ribbon cable connection to the host computer and screw terminal terminations for the relay outputs. Silk-screen labels on the board identify the relay elements to which they connect. The screw terminals used can accommodate wire sizes as large as #14 AWG.

To ensure that there is minimum susceptibility to EMI and minimum radiation, it is important that EMI cabling and break-out techniques be used. (cable connected to ground at the aperture of the digital I/O card that will provide signals, twisted pair wiring, etc.)

Power Connections

Connector J3 is provided for easy application of +5 VDC computer power via a quick disconnect cable from the computer power bus. Screw terminals are also provided for 5-volt external power to the card at TB13. (Note: Jumper JP1 must be installed if you intend to apply power through the screw terminals.) Alternatively, when the AC Power option is installed, JP1 should not be installed and the AC power is applied at TB13.

The following page illustrates the layout of the ROB-24.

Configurations

There are optional configurations for the ROB-24. These are as follows:

ROB-24-S01: The "S01" signifies that the card is configured for 115 VAC power input. When this option is installed, AC power must be applied at TB13 as described above. Also, IC drivers U1, U3, U4, U6, U7, and U9 are omitted.

ROB-24-S02: The "S02" option provides DPDT relay outputs.

ROB-24-S03: When this option is included, the card can accept inputs from an unbuffered digital I/O card.

ROB-24-S05: Normally, inputs are pulled down to ground through 680 Ω resistors. However, when option "S05" is included, inputs are pulled up to +5 VDC by means of jumpers at locations labeled JP2, JP3, and JP4.

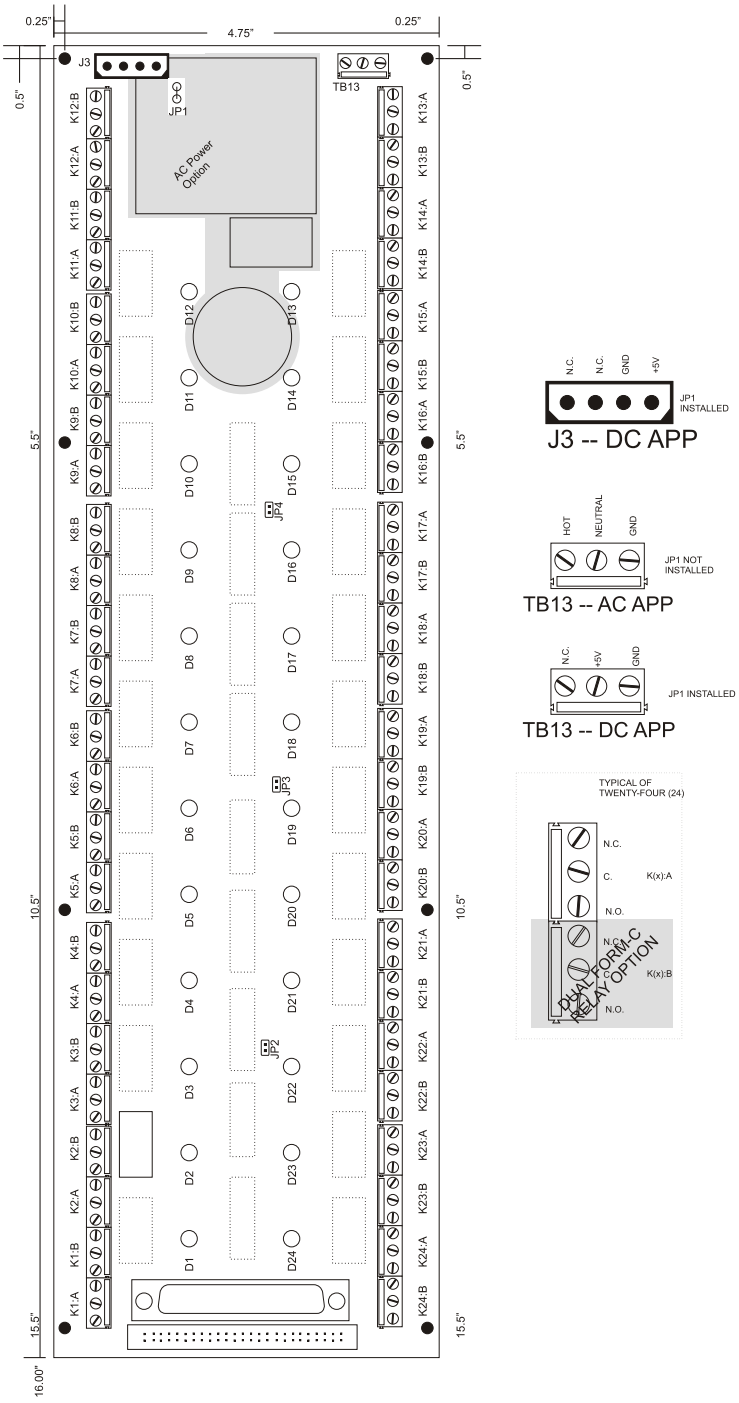

Figure 2-1: ROB-24 Layout

Chapter 3: Connector Pin Assignments

Either the 50-pin ribbon cable header (J2) or the 37-pin cable header (J1) is used to interface to the digital output board in the host computer. The mating connectors are a type AMP 1-746285-0 or equivalent (50 pins) or type AMP 745242-1 (37 pins) for insulation displacement flat cables or Cannon DC37-S (37 pins) for soldered connections.

Pin	Assignment	Pin	Assignment
1	Relay K16	2	Ground
3	Relay K15	4	"
5	Relay K14	6	"
7	Relay K13	8	"
9	Relay K12	10	"
11	Relay K11	12	"
13	Relay K10	14	"
15	Relay K9	16	"
17	Relay K24	18	"
19	Relay K23	20	"
21	Relay K22	22	"
23	Relay K21	24	"
25	Relay K20	26	"
27	Relay K19	28	"
29	Relay K18	30	"
31	Relay K17	32	"
33	Relay K8	34	"
35	Relay K7	36	"
37	Relay K6	38	"
39	Relay K5	40	"
41	Relay K4	42	"
43	Relay K3	44	"
45	Relay K2	46	"
47	Relay K1	48	"
49	Not Used	50	"

Table 3-1: Connector Pin Assignments for the 50-Pin Connector

Pin	Assignment	Pin	Assignment
1	Not Used	19	Not Used
2	Not Used	20	Not Used
3	Relay K24	21	Digital Common
4	Relay K23	22	Relay K16
5	Relay K22	23	Relay K15
6	Relay K21	24	Relay K14
7	Relay K20	25	Relay K13
8	Relay K19	26	Relay K12
9	Relay K18	27	Relay K11
10	Relay K17	28	Relay K10
11	Digital Common	29	Relay K9
12	Not Used	30	Relay K8
13	" "	31	Relay K7
14	" "	32	Relay K6
15	" "	33	Relay K5
16	" "	34	Relay K4
17	" "	35	Relay K3
18	" "	36	Relay K2
		37	Relay K1

Table 3-2: Connector Pin Assignments for the 37-Pin Connector

Customer Comments

If you experience any problems with this manual or just want to give us some feedback, please email us at: ***manuals@accesio.com.***. Please detail any errors you find and include your mailing address so that we can send you any manual updates.

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